

Applicant : George Cintra et al.
Serial No. : 10/034,901
Filed : December 27, 2001
Page : 8 of 11

Attorney's Docket No.: 08935-249001 / M-4965

REMARKS

Applicants have amended claims 1, 34, 35, 37, 40, and 44, and canceled claims 2 and 45. In particular, claim 1 has been amended to include the limitations of claim 2; claim 44 has been amended to include the limitations of claim 45; claim 34 has been amended to be in independent form; and claims 35, 37, and 40 have been amended to correct typographical errors. Clearly, these amendments raise no new issues. Claims 1, 3, 4, 9-11, 14, 15, and 34-44 are presented for examination.

Claims 1-4, 9-11, 14, and 15 are rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,402,796 (Johnson). Claim 1 is the only independent claim, which has been amended to recite the limitations of claim 2. As amended, claim 1 covers a method of making a battery electrode comprising forming a first layer comprising a cathode mixture on a substrate, removing the substrate from the first layer, and incorporating the first layer into the battery electrode, wherein the cathode mixture is in the form of a slurry.

Johnson does not disclose or suggest a cathode mixture in the form of a slurry. In rejecting claim 2, the Examiner did not explain how Johnson's cathode material (such as LiCoO_2) can be considered a slurry:

It is disclosed that the cathode sputtering device has a LiCoO_2 target or other suitable litigated metal oxide target that is energized so that battery cathodes are deposited upon the substrate (COL 3, lines 38-42). *Thus, the lithiated metal oxide compound is the active material mixture of matter acting as the slurry.*

(Page 4 of the Office Action, emphasis in the original.) Applicants do not understand how Johnson's lithiated metal oxide compound is acting as a slurry. Instead, Johnson suggests that the lithiated metal oxide is in the form of a solid target that is sputtered to form a thin film. And, according to Applicants' dictionary, a slurry is "a watery mixture of insoluble matter (as mud, lime, or plaster of paris)". (See Merriam Webster's Collegiate Dictionary, 10th Ed.) If the Examiner is relying on a reference for his position that Johnson's compound somehow acts as a

Applicant : George Cintra et al.
Serial No. : 10/034,901
Filed : December 27, 2001
Page : 9 of 11

Attorney's Docket No.: 08935-249001 / M-4965

slurry, Applicants request that the Examiner provide the reference so that it may be addressed. Otherwise, Applicants request that the rejection over Johnson be withdrawn.

Claims 34-45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson in view of U.S. Patent Application Publication 2002/0168576 (Hamamoto). The Examiner has acknowledged that Johnson does not describe the claimed cathode mixture components, and has relied on Hamamoto for the missing features. In combining these references, the Examiner sole motivation is:

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to employ the specific cathode mixture components of Hamamoto et al to make the battery electrode of Johnson because Hamamoto et al teach that battery cathodes can be prepared by mixing together the cathode active material, conducting aids, solvents and binders. Accordingly, such specific cathode mixture materials are suitable battery electrode components helping to provide a non-aqueous electrolyte battery having a satisfactory electric capacity and superior cycle characteristics and storage characteristics.

(Page 7 of the Office Action.) This combination, however, is contrary to the disclosure in Johnson.

Johnson is directed to thin film batteries. These batteries apparently can be used in small electronic devices that require high energy and high power densities. Johnson states, "Because of the requirements associated with such small electronic devices it is imperative that the battery which powers them be made as small as possible in order to provide the greatest volumetric power density." (col. 1, lines 23-26, emphasis added.) Accordingly, Johnson is directed to addressing these requirements: "[I]t is seen that a need remains for a method of producing a thin film battery with a greater volume of active material and a minimal volume of inactive material in order to achieve a high volumetric power density. It is to the provision of such therefore that the present invention is primarily directed." (col. 1, lines 35-40, emphasis added.) One approach that Johnson takes is to form a cathode thin film on a substrate, and subsequently removing the substrate since the substrate is made of inactive material that occupies the battery's volume, thereby increasing the volume available for active material.

Applicant : George Cintra et al.
Serial No. : 10/034,901
Filed : December 27, 2001
Page : 10 of 11

Attorney's Docket No.: 08935-249001 / M-4965

Thus, in light of Johnson's disclosure, one skilled in the art would not have been motivated to combine Hamamoto's conducting aids, solvents and/or binders with Johnson's metal oxide compounds, as suggested by the Examiner. Hamamoto's conducting aids, solvents and/or binders are not electrochemically active, so adding these materials is clearly contrary to Johnson's goal of minimizing the volume of inactive material and maximizing the volume of active material. Adding such materials can decrease the electrode's energy and power density, also contrary to Johnson's objectives. Furthermore, adding Hamamoto's material(s) (while maintaining the amount of active material) would increase the volume of the electrode. Again, this result is clearly contrary to Johnson's goal of producing a compact battery for use with small electronic devices. Therefore, Applicants submit that there is no motivation to combine to references. The rejection should be reconsidered and withdrawn.

With regard to the Interview Summary, Applicants agree with the Examiner's statements of Substance of the Interview insofar as claims 34-45 should be examined for patentability along with the other elected claims. As discussed with Examiners Alejandro and Ryan, claims 34-45, as originally added in the last Reply to an Office Action, properly depended from claim 1 of the elected group, and did not read on one or more of the non-elected species. Accordingly, the added claims should be entered and considered for patentability.

Applicants believe the claims are in condition for allowance, which action is requested. Upon allowance of the pending claims, Applicants request consideration of claims 5-8, 12, 13, 16-21 to additional species, which are written in dependent form or otherwise can be amended to include all the limitations of claim 1.

Applicant : George Cintra et al.
Serial No. : 10/034,901
Filed : December 27, 2001
Page : 11 of 11

Attorney's Docket No.: 08935-249001 / M-4965

Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: SEPTEMBER 8, 2004

Tu N. Nguyen
Tu N. Nguyen
Reg. No. 42,934

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906

20933247.doc